

# Microcosm-III

CIHR Institute of Infection and Immunity Newsletter

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## Message from the Scientific Director

### *III Responding to Emerging Challenges*

CIHR was created to be responsive to the health needs of Canadians. The Institutes' efforts to implement this vision are an indicator of the success of CIHR. It is both an honour and a tremendous responsibility to coordinate the Institutes' response to the emerging research challenges of Severe Acute Respiratory Syndrome and West Nile virus.

The appearance in Canada of the highly contagious and mysterious disease now known as SARS was a testing ground for the Institute. We demonstrated an ability to rapidly develop a program to invest in research critical to the understanding and control of a novel viral disease (please see results of the "Host Response to Severe Acute Respiratory Syndrome (SARS)" competition at [http://www.cihr-irsc.gc.ca/institutes/iii/funding/decisions/ii\\_sars\\_rfp\\_e.shtml](http://www.cihr-irsc.gc.ca/institutes/iii/funding/decisions/ii_sars_rfp_e.shtml)). The Institute created the early momentum, but our partners' willingness to be involved made the difference in the success of our initiative. The Institute's investment of funds for SARS research grew six-fold through partnership at the national level. We are grateful for the timely support we received, which increased the magnitude and potential impact of our program and contributed to the development of second-generation responses – another RFA, and the creation of the Canadian SARS Research Consortium (CSRC).

The Institute is working to fulfill its commitments to research in all priority areas. We are supporting three new Strategic Training Initiatives in Health Research and four New Emerging Team grants through the most recent strategic competition. But because the range of emerging diseases is not finite, we're



also working to prepare for emerging challenges before they become health threats – or perhaps even before we are aware of their existence. The need for this preparation was illustrated yet again in May 2003, when a case of the prion disease bovine spongiform encephalopathy (BSE) was discovered in a Canadian cow.

Many of you are aware of the budget uncertainty being faced by CIHR in the coming year, and of the adjustments being made to help the health research community over the long term. I invite you to join other members of the health research community and our partners in informing members of parliament of the need for multi-year budgets and increased investment in health research, so that we can continue to be responsive to the health needs of Canadians.

### **Dr. Bhagirath Singh**

Scientific Director

### *Results of III Photo Contest On the Lookout for Bugs*

Remember last September when we announced our photo contest? It was a busy winter, but we've finished our deliberations and are ready to announce the winners. Please visit our home page and look under "More Institute News".



Canadian Institutes  
of Health Research

Instituts de recherche  
en santé du Canada

Canada

## What's New at III

### Strategic Funding

*RFA launched June 2003*

- Pilot Project Grants for New Investigators
- Novel Technology Applications in Health Research (with Institute of Cancer Research)
- Social and Behavioural Research Issues in HIV/AIDS and Hepatitis C
- Planning Immunization Research Targeting Aboriginal People (Lead: Institute of Aboriginal Peoples' Health)
- Public Health and Health Care System Preparedness and Response to Severe Acute Respiratory Syndrome (SARS): Evaluation and Lessons Learned (Lead: Institute of Population and Public Health)
- New Perspectives on Gender and Health: Pilot Project Grants (Lead: Institute of Gender and Health)
- Global Health Research Pilot Project Grants (Lead: Institute of Population and Public Health)
- Reducing Health Disparities & Promoting Equity for Vulnerable Populations: Research Program Development Grants (Lead: Institute of Gender and Health)

*RFA launched July 2003*

- Fellowships in the research area of organ transplantation (with the Canadian Society of Transplantation and the Kidney Foundation of Canada)

*Previously launched*

- Targeting the Basic Defect in Cystic Fibrosis: Request for Applications to Develop Novel Therapeutic Approaches: March 2003
- Host Response to Severe Acute Respiratory Syndrome (SARS) Request for Proposals: April 2003. Funding decisions are available on our website.

For full details of all RFA, please visit our website:

[http://www.cihr-irsc.gc.ca/institutes/iii/index\\_e.shtml](http://www.cihr-irsc.gc.ca/institutes/iii/index_e.shtml)

### *CIHR HIV/AIDS Research Advisory Committee*

In March 2003, the Institute invited members of Canada's HIV/AIDS research and stakeholder communities to nominate representatives for a CIHR HIV/AIDS Research Advisory Committee. The committee will incorporate members representing multiple CIHR Institutes, HIV/AIDS researchers, Health Canada, the Ministerial Council for HIV/AIDS and broader community organizations. Functioning as a sub-committee of the Institute Advisory Board, it will ultimately advise CIHR on research priorities in HIV/AIDS.

### *Institute Advisory Board*

The IAB renewal process is underway and the Institute will be welcoming new board members to be announced by the CIHR Governing Council in July 2003.

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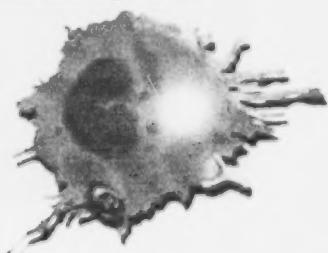
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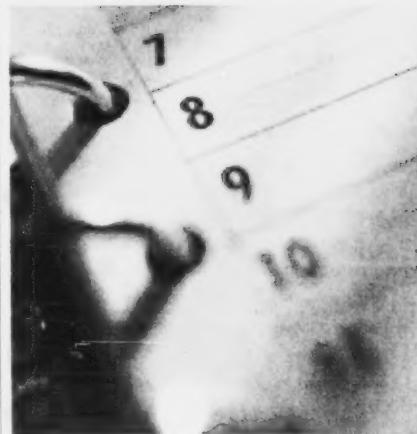
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**III Events—Future IAB meetings:** The next meeting of the Institute Advisory Board will take place September 2003, in Vancouver, B.C. The following meeting will be held January 2004 in Quebec City, Que. If you would like to meet with Institute staff or board members while we are in either city, please contact Bruce Moor ([bmoor@uwo.ca](mailto:bmoor@uwo.ca)).

**Meeting the Health Challenge of Prion Diseases:** In the wake of Canada's first case of bovine spongiform encephalopathy (BSE) in a decade, III and Health Canada will be hosting national and international experts on prion diseases in September 2003. The conference objectives are to review the etiology and transmission of prion diseases, the current state of international prion research, and make recommendations on a Canadian research agenda. Registrations are still being accepted but space is limited; contact Carol Richardson for details ([carol.richardson@uwo.ca](mailto:carol.richardson@uwo.ca)).



## III on the road

### Highlights of our travels in early 2003

- **January 9:** Health Canada West Nile Virus workshop in Ottawa, Ont.
- **January 31:** III Partnership Forum for Canada's non-profit organizations and professional societies in infection and immunity in Toronto, Ont.
- **February 15:** III and Health Canada-sponsored conference on Socio-Behavioural Aspects of Hepatitis C research in Toronto, Ont.
- **March 6:** HCV-HIV workshop at the Canadian Infectious Diseases Society (CIDS)/Canadian Association of Medical Microbiologists (CAMM) meeting in Quebec City, Que.
- **March 28-30:** Canadian Society for Immunology meeting, Lake Louise, Alta.
- **April 10-13:** Canadian Association for HIV Research conference in Halifax, N.S.
- **April 30-May 1:** Health Canada's international meeting on Severe Acute Respiratory Syndrome (SARS) in Toronto, Ont.
- **May 9:** Joint Advisory Committee of the CIHR/Health Canada Research Initiative on Hepatitis C Meeting in Ottawa, Ont.
- **May 30:** National Institute of Allergy and Infectious Diseases' (NIAID) response to SARS meeting at the National Institutes of Health (NIH) in Bethesda, Md.

## On the web

### On-line report: III Partnership Forum

Many of Canada's volunteer organizations and professional societies working in the areas of infection and immunity were represented at a two-day partnership forum hosted by III in Toronto, Ont., on Jan. 31 and Feb. 1, 2003. View the final report on our III Publications page.

### Visit our Research in Infection and Immunity page for feature articles

- Read a feature about the only doctoral research training program in Canada that fuses medicine and dentistry, and also adds a measure of biomedical engineering. Dr. Richard Ellen is leading a six-year CIHR strategic training initiative entitled **Cell Signaling in Mucosal Inflammation and Pain**. The program is one of 14 CIHR strategic training initiatives that fall within the research priority areas of the Institute of Infection and Immunity.
- With its recent allocation of \$45 million to the National Immunization Strategy (NIS) initiative, the federal government made a commitment to improving access to recommended vaccines. In a full-length feature article, Dr. Joanne Embree and Dr. Arlene King discuss the need for a national immunization strategy for Canada, and the form it will take.

## Vaccine Research in Canada

Vaccines eliminated polio in Canada, may someday routinely prevent chronic diseases such as cancer, ameliorate the effects of influenza, and are rushed into development when new diseases such as SARS surface. And on a day-to-day basis, they routinely protect children from life-threatening, serious infections. Things are good in Canada, but here are three examples of researchers with whom CIHR is working who want to make them better.

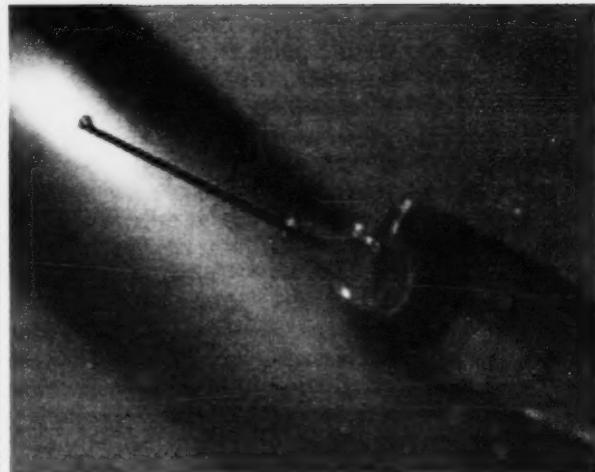
### *Public Health: Issues in Canada*

Dr. Joanne Embree is a strong proponent of a national immunization strategy to co-ordinate some of the issues relating to childhood vaccination in Canada. Chair of the Canadian Paediatric Society's Infectious Disease and Immunization Committee and Head of the Department of Medical Microbiology at the University of Manitoba, Embree says good epidemiological data is required for paediatricians to decide which vaccines should be offered to children. "You also need to look at why some children respond well to the vaccine, whereas other children don't," she says, pointing out that manufacturers don't typically perform that kind of research. There is also a raft of special populations with unique immunization issues, such as immunosuppressed individuals, refugees, pregnant mothers, and aboriginal populations. As well, some parents choose not to have their children vaccinated, and research is needed to find out why.

### *National Immunization Strategy*

In the 2003 federal budget, the government committed \$45 million over five years to assist in the pursuit of a national immunization strategy (NIS) with the objective of improving access to recommended vaccines, thereby reducing the incidence of vaccine-preventable diseases. As stated in the budget, a national strategy will result in improved safety and effectiveness of vaccines, enhanced coordination and efficiency of immunization procurement, and better information on immunization coverage rates within Canada.

CIHR has been closely involved in developing the research component of the proposed strategy. Research will be fundamental to many aspects of the NIS, says Dr. Arlene King, co-director of the NIS and Director of the Immunization and Respiratory Infections Division at Health Canada. She adds that it's anticipated that implementation of the research agenda will take place in collaboration with CIHR.



There are five key components to the NIS:

- National goals and objectives
- Collaborative program planning for equitable access
- Vaccine procurement for security and quality of supply
- Establishment of immunization registries
- Vaccine safety

The key components rest on a foundation of cross-cutting themes: communication, professional education, vaccine-preventable disease surveillance, special populations, and research.

### *A 21<sup>st</sup> Century Approach to Vaccine Development*

The Canadian Network of Vaccines and Immunotherapeutics (CANVAC), one of the federal Networks of Centres of Excellence, is working to develop both prophylactic and therapeutic vaccines for cancer and life-threatening viral infections. Diseases of focus include hepatitis C and HIV/AIDS, while more than 15 viral vaccines have already been licensed in North America. CANVAC is collaborating with III on its Request for Proposals "Host Response to Severe Acute Respiratory Syndrome (SARS)," by contributing support for successful projects and providing access to its state-of-the-art core facilities.

Dr. Rafick-Pierre Sékaly, chair of CANVAC and professor and researcher at the Université de Montréal Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CR-CHUM), holds several CIHR grants and awards. His work focuses on the mysterious aspects of the immune systems of individuals able to



fight off viruses that would easily overcome others' defences. These individuals hold clues for researchers hoping to use similar immune-related strategies in vaccine development. "My ultimate milestone is to be able to precisely define the features of an immune response that confer protection," says Sékaly.

Giving hepatitis C as an example, Sékaly says 20 per cent of infected individuals can clear the virus spontaneously. There is also a well-studied population of prostitutes in Nairobi who have escaped infection with HIV despite repeated exposure to the virus.

"If you know how the immune system on its own is able to control viremia, or a pathogen, that's how you'd like a vaccine to work," says Sékaly.

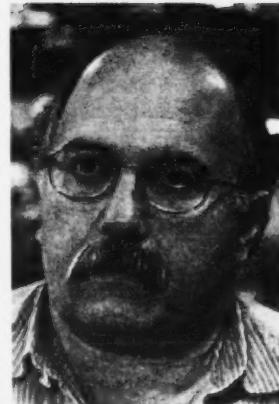
Developing assays to identify elements involved in protection is "the whole idea of the research which is done in my lab and at CANVAC," says Sékaly. New technologies, including developments in genomics and the capability of performing multi-parametric assays (the ability to study several parameters of an individual cell), allow the monitoring of discrete components of the immune response to the infectious agent. This had led to expanded capabilities in vaccine development.

## **Innovative Vaccine Development and Delivery: a guiding priority of the Institute of Infection and Immunity**

### *Funding commitments:*

The Institute is supporting a Health Research Program of Excellence grant in **Innovative vaccine development and delivery to induce mucosal immunity**, awarded in the November 2001 competition.

The Institute has also launched two additional initiatives: Following the emergence of concerns surrounding influenza re-vaccination, the Institute launched, in partnership with Health Canada, the Request for Proposals **Randomized Controlled Trial of persons with a history of Oculo-Respiratory Syndrome (ORS) following influenza vaccination** (summer 2002). In the June 2003 competition, the Institute launched the Request for Applications **Planning Immunization Research Targeting Aboriginal**



**"My ultimate milestone is to be able to precisely define the features of an immune response that confer protection,"**

**Dr. Rafick-Pierre Sékaly**

**People**, in partnership with the CIHR Institute of Aboriginal Peoples' Health.

### *Conference involvement:*

The Institute was a sponsor of the UBC Stanier Symposium on Vaccine Preparation and Vaccination, which took place in November of 2002 with a view to understanding pertinent mechanisms of pathogenicity in order to focus attention on unique attributes of pathogens involved in host interaction.

Scientific Director Dr. Bhagirath Singh attended the 5th Canadian National Immunization Conference in December 2002, in Victoria, B.C. A central theme of this conference was the articulation of a national immunization strategy.

### *Looking ahead:*

The Institute has convened an Immunization Awareness Working Group of 14 members representing behavioural science, public health, epidemiology, clinical research, aboriginal health, and ethics, to perform an inventory of activity in the field with the goal of RFA development.

### *CIHR funding for vaccine research:*

2000-01	\$7 million
2001-02	\$11.4 million
2002-03	\$13 million
2003-04	\$13.6 million
<b>TOTAL</b>	<b>\$45 million</b>

## The Institute Advisory Board... they make it possible

**Dr. Michel Bergeron, MD, FRCPC**

"I believe infectious disease is the most important problem on this planet," says Dr. Michel Bergeron, adding that it's a problem that causes a third of deaths every year. Bergeron believes new vaccines, diagnostic tests and drugs developed through proteomic and genomic approaches will be invaluable in preventing the spread of infectious diseases, in particular sexually transmitted diseases such as AIDS, for which expensive treatments will never be available in developing countries.

His attack on infectious disease began in 1971 at the Massachusetts Institute of Technology, continued at Tufts University, and led him back to his original alma mater, Laval University in Quebec City, in 1974. Currently Professor and Director of the Department of Microbiology and Director of the Infectious Diseases Research Center at Laval University, Bergeron laughs remembering his lab of 29 years ago. "I founded the Infectious Diseases Research Center in 1974 but I was alone—so it was not an infectious diseases research center, it was me." The center today employs 250 researchers and research personnel, and is the largest infectious disease research center in Canada. Major research areas include the pathogenesis of pneumococcal pneumonia and improved targeting of drugs for viral diseases, including HIV. Rapid DNA-based diagnostics for microbial pathogens and associated antibiotic resistance genes are also a major research focus. This technology can reduce a 48-hour turnaround on tests for microbes' identities and antibiotic susceptibilities to a turnaround of less than an hour. It's an area in which Dr. Bergeron has done pioneering work.

Dr. Bergeron is the recipient of major awards and distinctions including a 2000 Emeritus Physician's Medal from the Province of Quebec and the MEDEC Award for Medical Achievement. He says that although he loves making discoveries with his team, that's not the best part of his job. "The vision that you may train young people to become researchers that will help humanity, I think that's what drives us."



*He has devoted 30 years of his life to the study of infectious disease, and Dr. Michel Bergeron brings this rich experience as a researcher and clinician to his role as vice-chair of the Institute of Infection and Immunity Advisory Board (IAB).*

**Next, in the fall edition:** Dr. Abdallah Daar, Director, Program in Applied Ethics and Biotechnology, Public Health Sciences and Surgery, University of Toronto.

## From Concept to Reality

*"Institutes can act to help shape the research environment, while enhancing investigator-driven research" (final report of the CIHR Interim Governing Council).*

*Two and a half years in, are we living up to the vision?*

*Increasing funding for infection and immunity research*

Since its inception, the Institute has invested more than \$7.8 million, an amount that has grown through partnership, in research areas identified as priorities for development. These include:

- 24 operating and multi-user equipment grants
- 14 CIHR Strategic Training Initiatives in Health Research in areas including rural health, cell signaling, regenerative medicine, autoimmunity, and infectious disease (see partners in Microcosm-III, September 2002, and this newsletter p.8)

- 7 New Emerging Team (NET) Grant Programs in areas including diabetes, asthma, antimicrobial resistance, and host susceptibility to infection (see partners p.8; additional partners\*)
- 2 Health Research Programs of Excellence initiatives in vaccinology and transplantation
- 1 Needs, Gaps and Opportunities Assessment Grant in microbial safety of food and water (with the Canadian Water Network Centre of Excellence and the Natural Sciences and Engineering Research Council)

These initiatives build capacity in new and developing areas of research, stimulate the development of new research teams, and give researchers a building block to aid in future applications for funding. The Institute's support of operating and multi-user equipment grants through the CIHR open competition increases the likelihood that excellent investigator-initiated projects will acquire long-term support. The CIHR investment in research relating to the Institute of Infection and Immunity mandate totals approximately \$75 million annually through all funding programs.

The Institute is a voice for the infection and immunity research communities and raises awareness of research needs both within CIHR and to the federal government.

#### *Response to emerging challenges*

The events of this past year highlighted the significant research needs for arising issues in infection and immunity. III was the first federal organization to provide funding for research on SARS, launching a Request for Proposals within three weeks of the global alert issued by the WHO. The Institute of Infection and Immunity has also responded to approximately 100 requests for media interviews on SARS, West Nile virus and "mad cow" disease - contributing to increased awareness among the public of CIHR and its work, and, we hope, to increased demand for investment in health research.

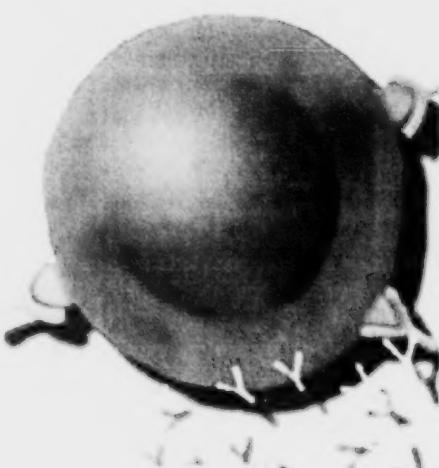
The Institute is working to address extensive research needs identified by stakeholder communities. HIV/AIDS and hepatitis C infection rates continue to rise in certain populations characterized by distinct social and behavioural patterns. To better understand the opportunities for reversing this trend, we launched an RFA in June 2003 for research into the

socio-behavioural aspects of these diseases. In the summer of 2001, the Institute took the lead in creating the 16-member Canadian Research Coalition for Safe Food and Water, formed in response to the challenges illustrated by the outbreak of *E. coli* in Walkerton, Ont. in 2000. The Coalition will announce the results of its second competition to support food and water safety research in the fall.

#### *A new vision*

The Institute has evolved over its two-and-a-half-year existence, guided by its own vision: to establish national leadership, priorities and programs that promote innovative research to reduce the global burden of infection and immune-based disease and improve quality of life. The CIHR structure enables us to consult a wide variety of stakeholders in the pursuit of this vision, leading to the development of comprehensive research responses. As our stakeholders, your input will strengthen our efforts to provide support for your research goals.

\*Juvenile Diabetes Research Foundation; CIHR Institute of Nutrition, Metabolism and Diabetes; CIHR Institute of Human Development, Child and Youth Health; CIHR Institute of Circulatory and Respiratory Health



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### Institute of Infection and Immunity Strategic Funding Announcements April 2003

#### CIHR Strategic Training Program Grants

Principal Investigator	Title	Partners
Dr. Jack ANTEL, McGill University	Integrated Training Program in Basic and Clinical Aspects of Neuroinflammation	INMHA, FRSQ
Dr. Anthony CHOW, Vancouver Hospital & Health Sciences Centre	UBC Training Program for Translational Research in Infectious Diseases	
Dr. Elizabeth Jane HEATHCOTE, University Health Network, Toronto Western Hospital	A National Hepatitis C Research Training Program Grant	Joint Health Canada / CIHR Initiative on Hepatitis C

#### New Emerging Team (NET) Grant Program

Principal Investigator	Title	Partners
Dr. Mark LOEB, McMaster University	Anti-microbial use and resistance in seniors	IHSPR, CBDN
Dr. Michael MULVEY, University of Manitoba	Community acquired antimicrobial resistant bacteria in northern Canadian communities	IPPH, CBDN
Dr. Michel TREMBLAY, Centre hospitalier de l'Université Laval	Transcriptome and proteome analyses of human lymphoid tissue cultured <i>ex vivo</i> as a new experimental model system to study host susceptibility to HIV-1 infection	
Dr. Silvia VIDAL, University of Ottawa	Forward genetics to identify novel pathways in host response to infection: From mouse models to patients	

INMHA - CIHR Institute of Neurosciences, Mental Health and Addiction

FRSQ - Le Fonds de la recherche en santé du Québec

IHSPR - CIHR Institute of Health Services and Policy Research

CBDN - Canadian Bacterial Diseases Network

IPPH - CIHR Institute of Population and Public Health

#### Institute Advisory Board

**Lorne A. Babiuk** *University of Saskatchewan (Chair)*

**Michel G. Bergeron** *Laval University*

**Chris Bleackley** *University of Alberta*

**Abdallah Daar** *University of Toronto*

**B. Brett Finlay** *University of British Columbia*

**Jack Gauldie** *McMaster University*

**Kevin Glasgow** *McMaster University*

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**Danielle Malo** *McGill University*

**William E. Paul** *National Institutes of Health (U.S.)*

**Francis Plummer** *Health Canada, National Microbiology Laboratory*

**Helaine Shiff** *Juvenile Diabetes Research Foundation*

**Steffanie Strathdee** *Johns Hopkins School of Hygiene and Public Health*

**Robyn M. Tamblyn** *Royal Victoria Hospital Montreal*